

WHAT IS CLAIMED IS:

1. A vehicle AC generator comprising:

a case;

a shaft journaled in the case;

a rotor secured to the shaft so as to be disposed in the case;

a stator supported by the case so as to be disposed to cover the external periphery of the rotor;

ventilating means rotated together with the rotor; and

a rectifier unit cooled by the ventilating means, the rectifier unit comprising:

cooling plates for the positive-electrode and negative-electrode sides disposed at a predetermined interval and each having principal planes opposing each other; and

a diode package disposed between the cooling plates for the positive-electrode and negative-electrode sides, the diode package comprising:

a unidirectionally conducting element for the positive-electrode side;

a unidirectionally conducting element for the negative-electrode side having a cathode face joined to an anode face of the unidirectionally conducting element for the positive-electrode side by interposing an AC input terminal therebetween;

a base for the positive-electrode side formed of a metallic plate and joined to a cathode face of the unidirectionally conducting element for the positive-electrode side;

a base for the negative-electrode side formed of a metallic plate and

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joined to an anode face of the unidirectionally conducting element for the negative-electrode side; and

an insulating resin provided so that the unidirectionally conducting elements for the positive-electrode and negative-electrode sides are embedded therein, at least end faces of the respective bases for the positive-electrode and negative-electrode sides are exposed therefrom on both sides in the depositing direction of the unidirectionally conducting elements for the positive-electrode and negative-electrode sides, and the top end of the AC input terminal extends therefrom,

wherein in the diode package, the end face of the base for the positive-electrode side is joined to the principal plane of the cooling plate for the positive-electrode side while the end face of the base for the negative-electrode side is joined to the principal plane of the cooling plate for the negative-electrode side.

2. A vehicle AC generator according to Claim 1, wherein the unidirectionally conducting elements for the positive-electrode and negative-electrode sides are respectively formed of a mesa-type diffusion element made by p-n junction of a p-semiconductor and an n-semiconductor using n-silicon.

3. A vehicle AC generator according to Claim 1, wherein the face of the base for the positive-electrode side to be joined to the unidirectionally conducting element for the positive-electrode side has the same area as or a larger area than a cathode face area of the unidirectionally conducting element for the positive-electrode side while the face of the base for the negative-electrode side

*base & side*

to be joined to the unidirectionally conducting element for the negative-electrode side has the same area as or a larger area than an anode face area of the unidirectionally conducting element for the negative-electrode side, and wherein furthermore the faces of the AC input terminal to be interposed between the unidirectionally conducting elements for the positive-electrode and negative-electrode sides respectively have the same areas as or larger areas than the anode face area of the unidirectionally conducting element for the positive-electrode side and the cathode face area of the unidirectionally conducting element for the negative-electrode side.

base > dim  
faces  
AC term. >  
dim

4. A vehicle AC generator according to Claim 1, wherein the junction area between the base for the positive-electrode side and the cooling plate for the positive-electrode side is the same as or larger than the junction area between the base for the positive-electrode side and the unidirectionally conducting element for the positive-electrode side while the junction area between the base for the negative-electrode side and the cooling plate for the negative-electrode side is the same as or larger than the junction area between the base for the negative-electrode side and the unidirectionally conducting element for the negative-electrode side.

base/cooling plate  
≥ base/plate  
base/cooling plate  
≥ base/plate
5. A vehicle AC generator according to Claim 1, wherein the AC input terminal has a joint structure.
6. A vehicle AC generator according to Claim 1, wherein the portion of the AC input terminal extending from the insulating resin has a bent structure.

7. A vehicle AC generator according to Claim 1, wherein the bases for the positive-electrode and negative-electrode sides are respectively soldered to the cooling plates for the positive-electrode and negative-electrode sides.
8. A vehicle AC generator according to Claim 7, wherein the bases for the positive-electrode and negative-electrode sides are respectively made from a copper material while respective junction faces of the bases for the positive-electrode and negative-electrode sides to the cooling plates for the positive-electrode and negative-electrode sides are nickel-plated.
9. A vehicle AC generator according to Claim 1, wherein at least one of the junction between the base for the positive-electrode side and the cooling plate for the positive-electrode side and the junction between the base for the negative-electrode side and the cooling plate for the negative-electrode side is performed by press-fitting.
10. A vehicle AC generator according to Claim 9, wherein the base to be press-fitted extends from the insulating resin in the direction orthogonal to the depositing direction of the unidirectionally conducting elements for the positive-electrode and negative-electrode sides and the extending portion of the base has an external peripheral side knurled thereon.
11. A vehicle AC generator according to Claim 1, wherein the ventilating means is composed of a fan, and in the diode package, the central point of the

unidirectionally conducting elements for the positive-electrode and negative-electrode sides which are deposited in one piece is arranged to be positioned in the outer diameter side further than the central point of fan blades with respect to the shaft.

12. A vehicle AC generator according to Claim 11, wherein the cooling plates for the positive-electrode and negative-electrode sides extend inwardly in the radial direction with respect to the shaft, and a large number of ventilating holes are formed in the extending portions of the cooling plates so as to penetrate the extending portion in parallel with the shaft.
13. A vehicle AC generator according to Claim 1, wherein in the diode package, the AC input terminal is radially outwardly oriented with respect to the shaft, and an air intake opening is formed in a portion of the case opposing to the AC input terminal.
14. A vehicle AC generator according to Claim 1, wherein the insulating resin contains particles of an inorganic calcined product.
15. A vehicle AC generator according to Claim 1, wherein in the diode package, any one of  $3n$  sets and  $4n$  sets of the unidirectionally conducting elements for the positive-electrode and negative-electrode sides, each set of the unidirectionally conducting elements for the positive-electrode and negative-electrode sides being constructed by depositing the unidirectionally conducting elements for the positive-electrode and negative-electrode sides in one piece by

interposing the AC input terminal therebetween, is aligned, cathode faces of the unidirectionally conducting elements for the positive-electrode side constituting any one of  $3n$  sets and  $4n$  sets of the unidirectionally conducting elements for the positive-electrode and negative-electrode sides are joined to the one base for the positive-electrode side extending in the aligning direction while anode faces of the unidirectionally conducting elements for the negative-electrode side constituting any one of  $3n$  sets and  $4n$  sets of the unidirectionally conducting elements for the positive-electrode and negative-electrode sides are joined to the one base for the negative-electrode side extending in the aligning direction, and any one of  $3n$  sets and  $4n$  sets of the unidirectionally conducting elements for the positive-electrode and negative-electrode sides are embedded in the insulating resin.

16. A vehicle AC generator according to Claim 15, wherein heat-radiation fins are provided in an end face of either of the bases for the positive-electrode and negative-electrode sides.

17. A vehicle AC generator according to Claim 15, wherein the ventilating means is composed of a fan, and in the diode package, the central point of the unidirectionally conducting elements for the positive-electrode and negative-electrode sides which are deposited in one piece is arranged to be positioned in the outer diameter side further than the central point of fan blades with respect to the shaft.

18. A vehicle AC generator according to Claim 17, wherein the cooling plates

for the positive-electrode and negative-electrode sides extend inwardly in the radial direction with respect to the shaft, and a large number of ventilating holes are formed in the extending portions of the cooling plates so as to penetrate the extending portion in parallel with the shaft.

19. A vehicle AC generator according to Claim 15, wherein in the diode package, the AC input terminal is radially outwardly oriented with respect to the shaft, and an air intake opening is formed in a portion of the case opposing to the AC input terminal.